NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Washington, D.C. 20594

August 1, 2017

Weather Study

METEOROLOGY

DCA17PM012

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A. MARINE ACCIDENT

Location: Lake Pontchartrain, Louisiana
Date: May 2, 2017
Time: Grounding 1000 central daylight time May 2, sinking 2000 CDT May 3, 2017
Vessel: CG NOLA RB-5 and S/V Vanguard

B. METEOROLOGIST

Don Eick
Meteorologist Specialist
Operational Factors Division (AS-30)
National Transportation Safety Board

C. SUMMARY

On May 2, 2017 about 1000 central daylight time (CDT) the *sailing vessel Vanguard* ran aground outside of North Shore Channel, near Marker #7 (buoy – green) after departing the Rigolets pass enroute to Lake Pontchartrain Marina. Interviews indicated strong winds pushed water out of the lake producing lower than normal tides on May 2nd. Heavy rain and strong winds swept into Lake Pontchartrain area on May 3rd creating 3-4' seas and 25 knot winds and lasted throughout the day to include the time when United States Coast Guard Station New Orleans CG NOLA RB-S 291113 attempted to tow the *Vanguard* at approximately 1715 CDT. The vessel sank at approximately 2000 CDT while under tow.

D. DETAILS OF THE INVESTIGATION

The National Transportation Safety Board's (NTSB) Senior Meteorologist was not on scene for this investigation and conducted the meteorology phase of the investigation from the Washington D.C. office, collecting data from official National Weather Service (NWS) sources including the Weather Prediction Center (WPC) and the National Center for Environmental Information (NCEI). All times are central daylight time (CDT) based upon the 24 hour clock, local time is +5 hours to UTC, and UTC=Z. Directions are referenced to true north and distances in nautical miles. Heights are above mean sea level (msl) unless otherwise noted. Visibility is in statute miles and fractions of statute miles.

The following coordinates are used in this investigation; grounding on May 2, 2017 about 1000 CDT at latitude 30° 11' 7.68" N and longitude 89° 46'36.46" W. Sinking occurred on May 3rd about 2000 CDT at latitude 30° 12'6.88" N and longitude 89° 50'8.64".

E. FACTUAL INFORMATION

1.0 Synoptic Conditions

The synoptic or large scale migratory weather systems influencing the area were documented using standard NWS charts issued by the National Center for Environmental Prediction (NCEP) located in Camp Springs, Maryland. These are the base products used in describing weather features and in the creation of forecasts and warnings. Reference to these charts can be found in the joint NWS and Federal Aviation Administration Advisory Circular "Aviation Weather Services", AC 00-45H.

1.1 Surface Analysis Charts

The southcentral section of the NWS Surface Analysis Chart for 0700 CDT (1200Z) on May 2, 2017 centered over Louisiana is included as figure 1 with the approximate location of the grounding marked by a red star. The chart depicted a high pressure system centered over the Florida panhandle at 1019-hectopascals (hPa) with a ridge of high pressure extending westward over Louisiana and Texas. A cold front was depicted over central Florida with a dissipating warm front over the Gulf of Mexico to the south of the accident site. Another stationary front was located over northeast Texas. The station models surrounding the time of the grounding of the S/V Vanguard indicated calm to light winds, clear skies, with temperatures in the 50's degrees Fahrenheit (°F).

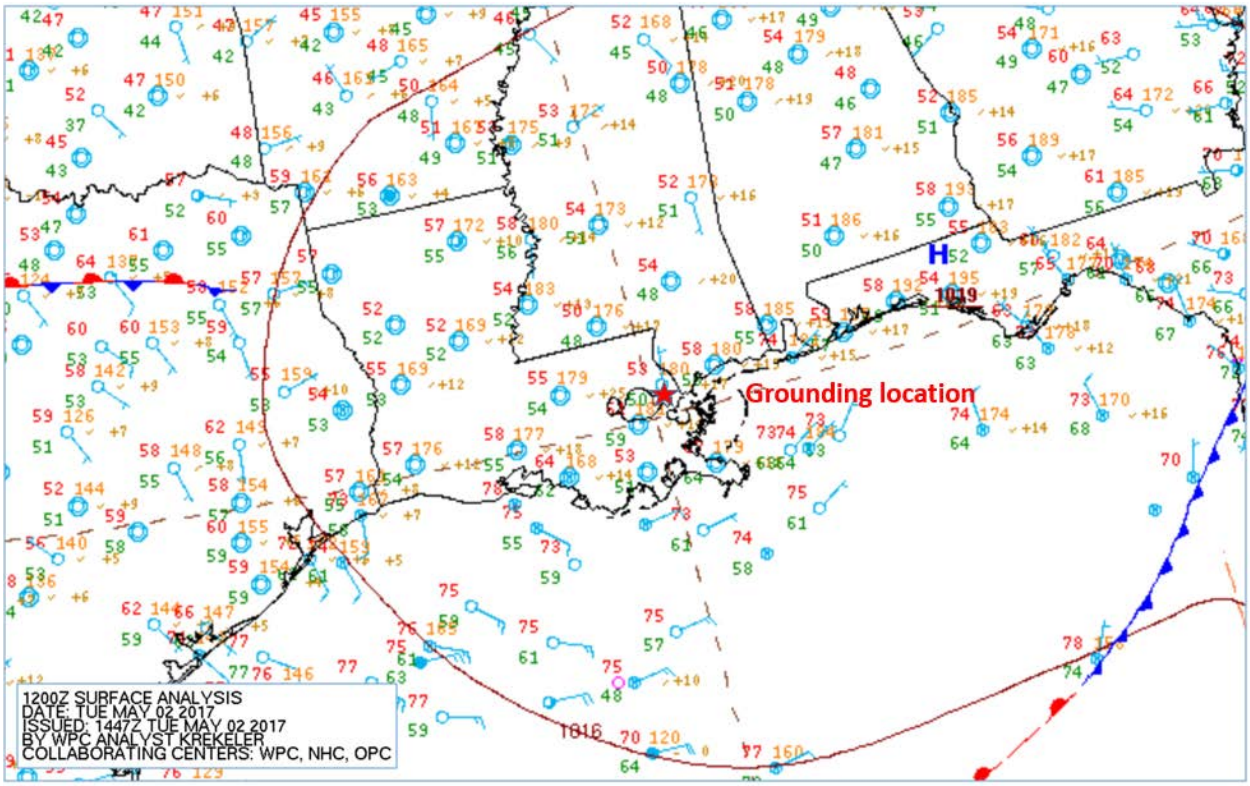

Figure 1 - NWS Surface Analysis Chart at 0700 CDT on May 2, 2017 near time of grounding

Figure 2 is the southcentral section of the NWS Surface Analysis Chart at 1300 CDT on May 3rd depicting the conditions mid-day prior to the sinking. The chart depicted multiple low pressure systems generally along a frontal boundary stretching from Tennessee southwestward across Arkansas, into Texas at 1010-, 1007, and 1006-hPa respectively. A warm front extended from one of the low's over northeast Texas southward across eastern Texas and then became a stationary frontal boundary extending eastward across southern Louisiana and into the Gulf of Mexico to the south of the accident site. The general pressure gradient remained relatively light over the region with a general southeast wind flow pattern. Several stations reported thunderstorms, which altered the general wind flow pattern, with thunderstorms reported in the vicinity of Lake Pontchartrain during this period.

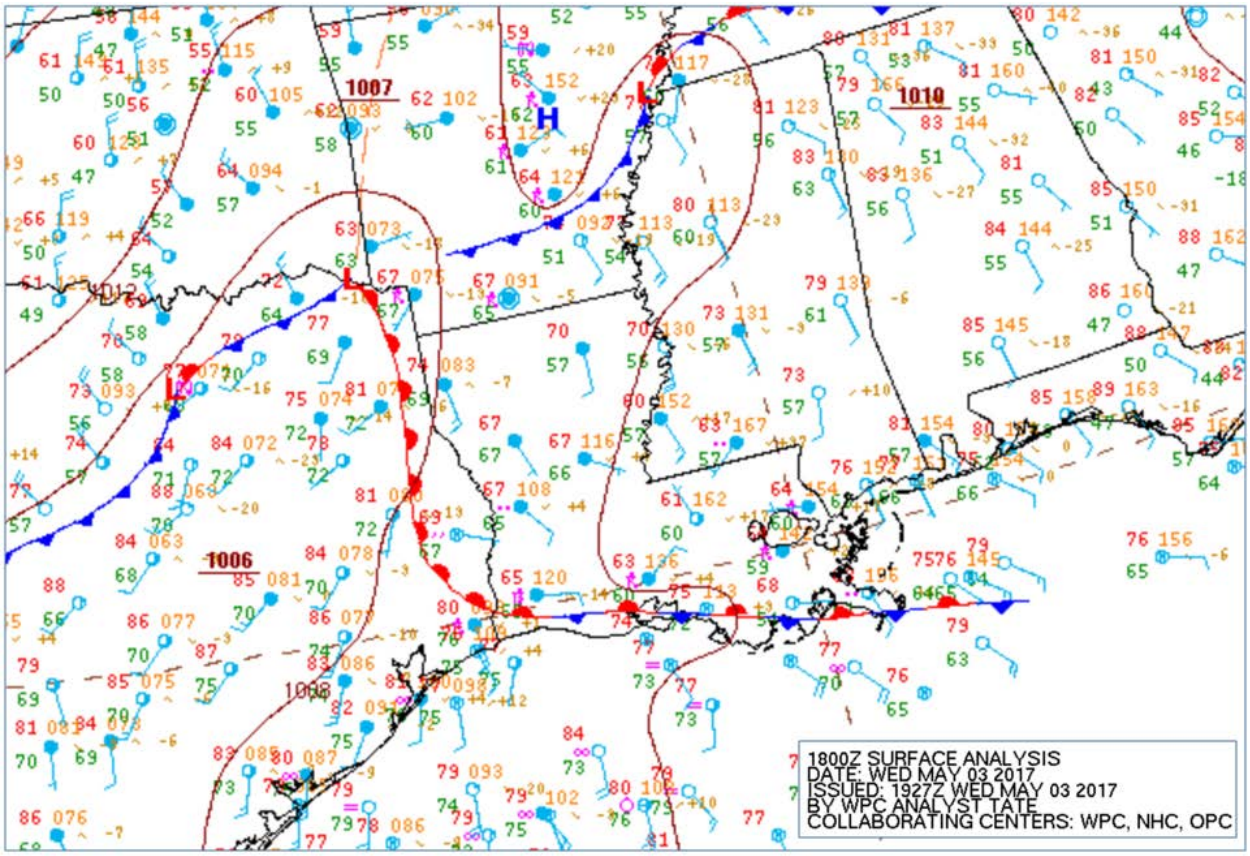

Figure 2 - NWS Surface Analysis Chart for 1300 CDT on May 3rd

Figure 3 is the section of the NWS Surface Analysis Chart at 1900 CDT immediately prior to the sinking on May 3rd with the sinking location indicated by the red star. The chart depicted a low pressure system over northern Louisiana at 1004-hPa along a frontal wave with a cold front extending southwestward into Louisiana and Texas, and a stationary front extending east-northeast across Arkansas and Mississippi. A squall line or active line of thunderstorms was depicted in the warm air sector ahead of the front stretching across northern Louisiana bowing outwards and extending into southeastern Texas, and was moving to the southeast. A high pressure system was located immediately behind the squall line between the front at 1010-hPa. Another stationary frontal boundary was depicted extending from eastern Texas into the Gulf of Mexico off Louisiana. The station models surrounding the sinking location depicted winds from the southeast at 15 knots,

overcast sky conditions with multiple stations reporting rain and thunderstorms, and fog/mist over the gulf coastal stations, with temperatures in the mid 60's F.

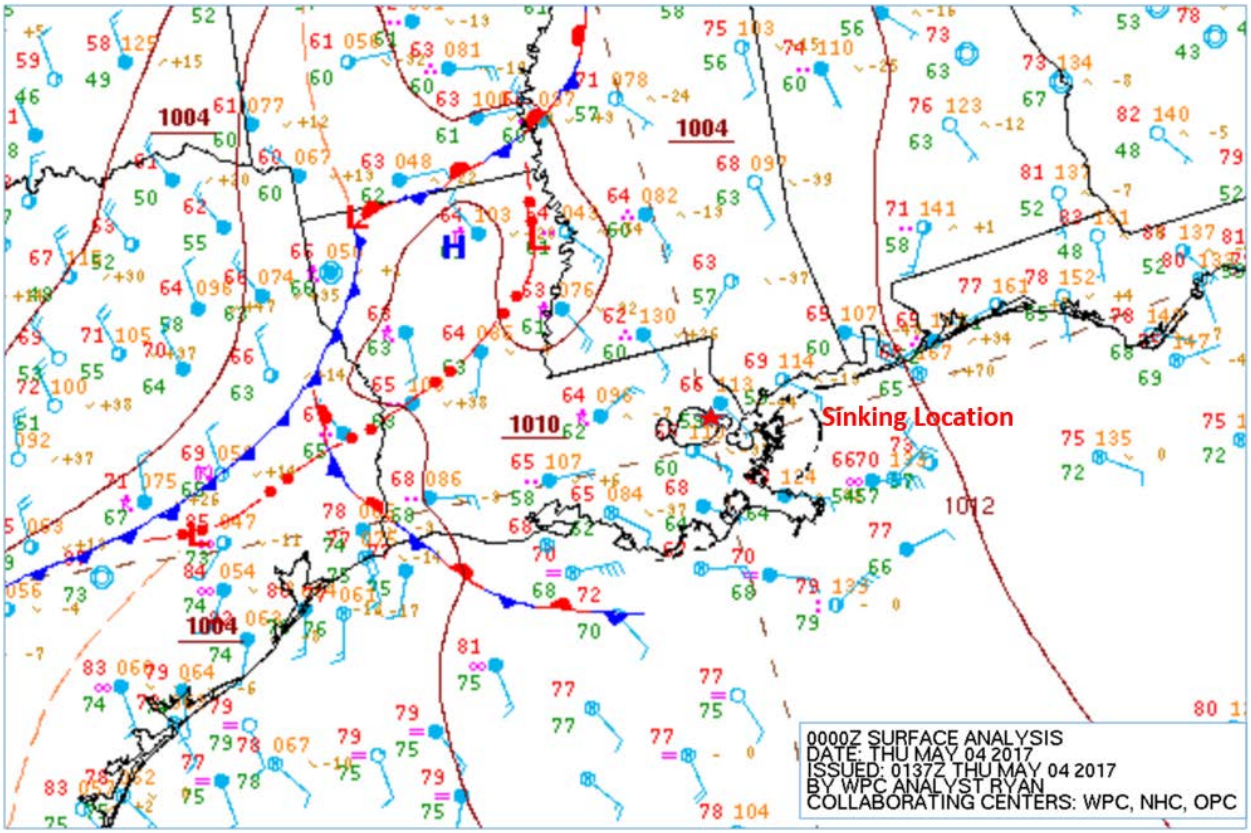

Figure 3 - NWS Surface Analysis Chart for 1900 CDT prior to the sinking

1.2 Convective Outlook

The NWS Storm Prediction Center's (SPC) day 1 Convective Outlook Chart identifying where the NWS was expected general and severe thunderstorm development during the morning of May 3rd is included as figure 4. The morning forecast highlighted an enhanced risk[1] of severe thunderstorm development over eastern Texas, Louisiana, southern Arkansas, and southwestern Mississippi during the period. An enhanced risk implied the probability of numerous severe thunderstorms were possible in the area, with more widespread and intense thunderstorms. A severe thunderstorm is defined as one producing a tornado, hail of one inch or larger, and/or damaging winds of 50 knots or more. In this particular case, the highest risk was for damaging winds and was over 30% probability.

[1] The risk categories range from general thunderstorms, and then range from 1 to 5 with marginal, slight, enhanced, moderate, and high risk categories for long-lived severe weather and particular intense large scale tornado events.

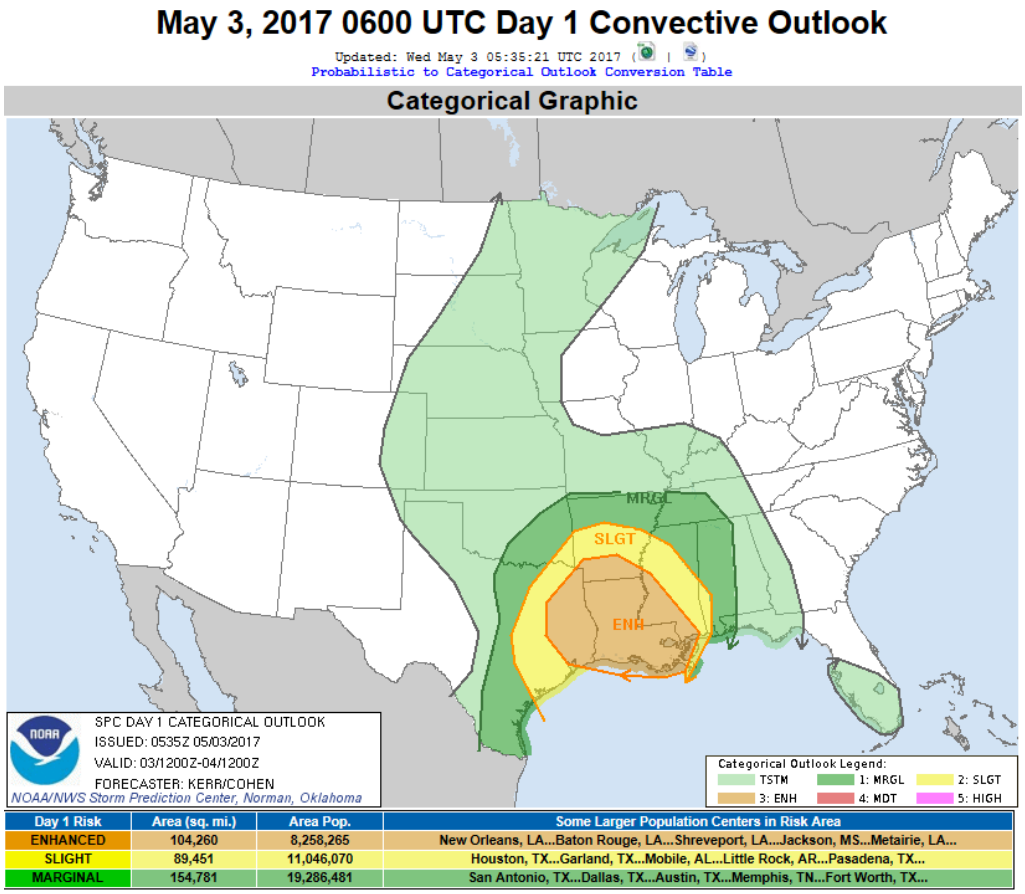

Figure 4 - NWS SPC Convective Outlook on May 3, 2017

1.3 National Radar Mosaic Image

The National radar mosaic images for 2000 and 2025 CDT on May 3, 2017 are included as figure 5 and 6 respectively over the region with the location of the sinking of the S/V Vanguard marked by a star. A line of intense to extreme intensity echoes is noted over the Lake Pontchartrain and the leading edge was just reaching the ships location at 2000 CDT and was located immediately east at 2025 CDT at the time of the sinking. The line was likely associated with strong gusting winds, heavy rain, near zero visibility conditions, and lightning.

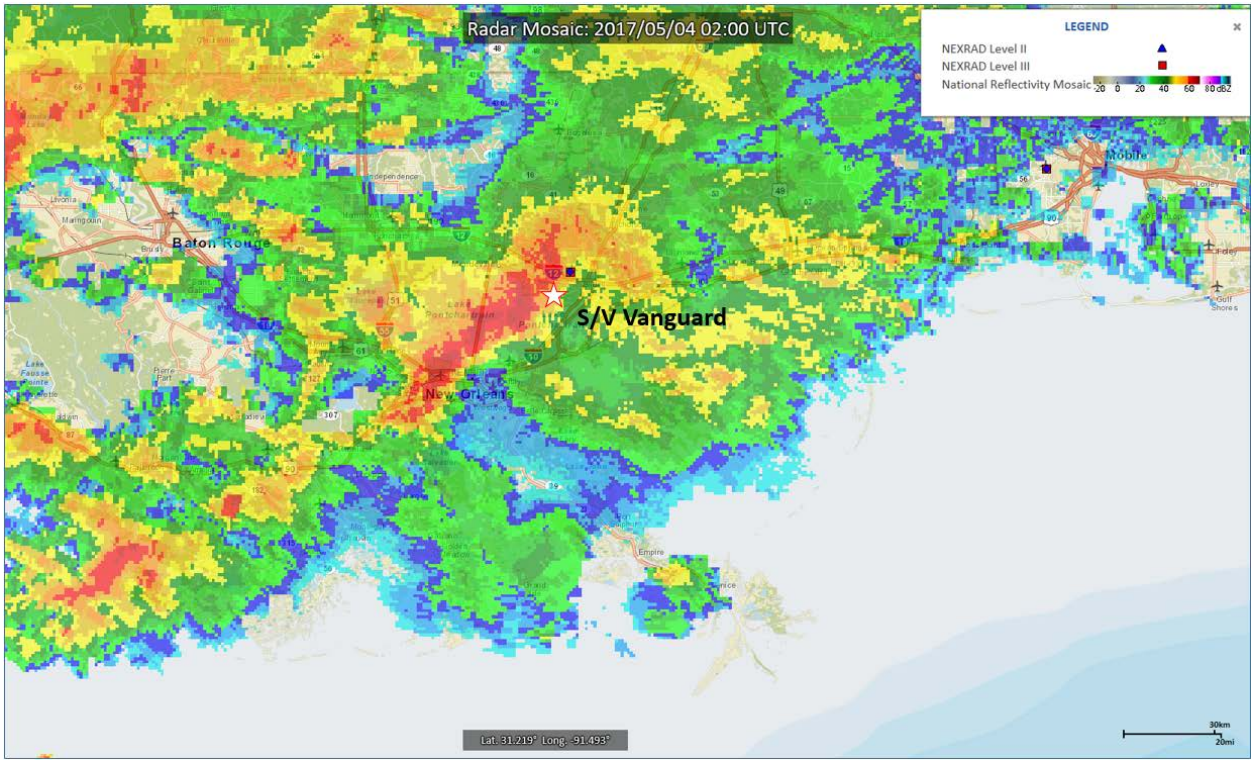

Figure 5 - National radar mosaic for 2000 CDT on May 3rd

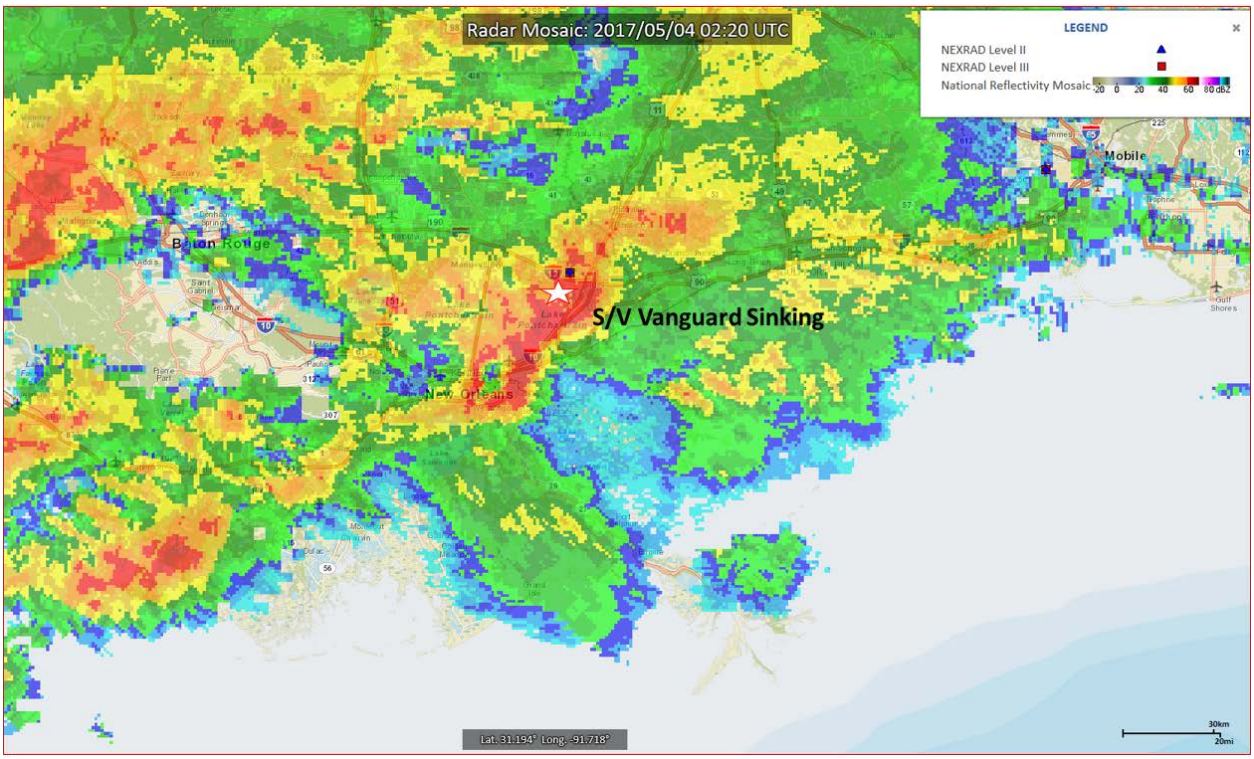

Figure 6 - NWS National radar mosaic at 2120 CDT at the time of the sinking

2.0 Surface Observations

The closest NWS weather observations surrounding the grounding and the sinking were documented.

2.1 Slidel, Louisiana

The closest weather reporting station to the accident/sinking site was located about 10 miles north at Slidel Airport (KASD), Slidel, LA, at an elevation of 28 ft. The station had an Automated Surface Observation System (ASOS) with a precipitation discriminator. The following table are the observations from the time of the grounding through the time of the sinking. The times have been converted to local time. The ceiling height or cloud layer is in 100's of feet (ft) above ground level (agl) followed by the coverage, where sky is reported as clear (CLR), a few clouds (FEW), partly cloudy or scattered (SCT), broken or mostly cloudy (BKN), overcast (OVC). With regards to weather type (WX); R is rain, T is thunderstorm, and the intensity of the precipitation is minus sign (-) for light, no sign moderate, plus (+) is heavy.

ID (STN)	TIME (CDT)	T (F)	TD (F)	RH (%)	DIR (°tr)	SPD (KT)	GST (KT)	ALT ("Hg)	SLP (hPa)	VIS (SM)	CIG	COV	WX	MAX (F)	MIN (F)	PR6 (IN)	PR24 (IN)
May 2, 2017																	
KASD	0053	57	54	89	000	0		29.99	1015.4	10		CLR		83	53		
KASD	0153	56	53	90	150	3		30.00	1015.8	10		CLR					
KASD	0253	55	52	89	000	0		30.01	1016.2	10		CLR					
KASD	0353	53	51	93	010	4		30.01	1016.3	10		CLR					
KASD	0453	54	51	90	000	0		30.02	1016.6	10		CLR					
KASD	0553	52	50	93	000	0		30.04	1017.2	10		CLR					
KASD	0653	53	50	89	010	3		30.06	1018.0	10		CLR		57	52		
KASD	**0753**	**63**	**56**	**78**	**000**	**0**		**30.08**	**1018.5**	**10**		**CLR**					
KASD	0853	73	61	66	000	0		30.09	1018.8	10		CLR					
KASD	0953	78	56	47	140	7		30.09	1018.9	10		CLR					
KASD	1053	81	53	38	140	7		30.09	1018.8	10		CLR					
KASD	1153	82	49	32	140	6		30.08	1018.5	10		CLR					
KASD	1253	83	48	30				30.07	1018.1	10		CLR		83	53		
KASD	1353	84	51	32	170	9		30.05	1017.6	10		CLR					
KASD	1453	84	50	31	180	6		30.04	1017.2	10		CLR					
KASD	1553	84	50	31	000	5		30.02	1016.6	10		CLR					
KASD	1653	83	50	32	170	3		30.01	1016.1	10		CLR					
KASD	1753	82	53	37	150	6		30.00	1015.7	10		CLR					
KASD	1853	79	56	45	160	5		29.99	1015.7	10		CLR		84	79		
KASD	1953	72	59	64	150	3		30.00	1016.0	10		CLR					
KASD	2053	69	59	70	000	0		30.02	1016.4	10		CLR					
KASD	2153	66	60	81	000	0		30.03	1016.9	10		CLR					
KASD	2253	65	60	84	000	0		30.03	1016.9	10		CLR					
KASD	2353	63	59	87	000	0		30.02	1016.7	10		CLR					
May 3, 2017																	
KASD	0053	61	57	87	000	0		30.01	1016.3	10		CLR		84	52		
KASD	0153	59	56	90	000	0		30.00	1015.8	10		CLR					
KASD	0253	58	55	90	000	0		29.98	1015.3	10		CLR					
KASD	0353	56	54	93	010	3		29.97	1014.7	10		CLR					
KASD	0453	56	54	93	000	0		29.97	1014.9	10		CLR					
KASD	0553	56	54	93	000	0		29.98	1015.0	10		CLR					
KASD	0653	57	55	93	000	0		29.99	1015.4	10		CLR		61	55		
KASD	0753	65	61	87	000	0		29.98	1015.0	10		CLR					

KASD	0853	76	67	74	150	7		29.97	1015.0	10		CLR					
KASD	0953	77	64	64	150	11		29.94	1013.7	10		CLR					
KASD	1053	76	64	67	150	7		29.96	1014.6	10	110	FEW					
KASD	1035	75	63	66	180	15	G 18	30.00		10	110	BKN					
KASD	1053	73	64	73	180	16	G 21	29.98	1015.2	10	120	BKN					
KASD	1212	70	57	63	140	11	G 19	29.96		9	110	OVC	R-				
KASD	1239	66	61	84	260	5		29.96		9	110	OVC					
KASD	1253	64	60	87	280	6		29.99	1015.4	7	110	OVC	TR-		77	64	0.07
KASD	1302	63	60	90	300	4		29.99		4	100	OVC					
KASD	1309	63	60	90	290	4		30.00		3	100	OVC	TR				
KASD	1317	63	60	90	080	4		29.98		2.5	100	OVC	TR				
KASD	1326	63	60	90	070	5		29.95		4	100	OVC	TR				
KASD	1353	62	60	93	320	6		29.96	1014.5	4	100	OVC	TR				
KASD	1412	62	60	93	310	8		30.01		7	100	OVC					
KASD	1420	62	60	93	280	6		30.03		6	50	OVC	TR-				
KASD	1429	62	60	93	000	5		30.06		1.8	55	OVC	TR+				
KASD	1453	62	61	96	300	4		30.07	1018.2	2.0	55	OVC					
KASD	1505	63	61	93	000	4		30.07		3	55	OVC	TR				
KASD	1525	63	62	97	130	4		30.04		3	70	OVC					
KASD	1533	63	61	93	080	10		29.98		3	65	OVC	TR+				
KASD	1548	63	63	100	020	3		30.00		6	65	OVC	TR-				
KASD	1553	63	62	97	000	0		30.00	1015.8	9	4	OVC	TR-				
KASD	1600	63	61	93	000	0		29.99		9	4	OVC					
KASD	1611	63	61	93	000	3		30.00		7	5	OVC					
KASD	1619	63	62	97	350	6		29.97		8	5	OVC	R-				
KASD	1637	62	61	96	080	5		29.96		10	39	BKN	R-				
KASD	1653	62	61	96	100	9		29.88	1011.9	10	3	FEW					
KASD	1753	64	61	90	130	10	G 20	29.85	1010.9	10		CLR					
KASD	1853	66	59	78	150	6		29.87	1011.3	10	100	OVC			66	62	0.59
KASD	1943	66	61	84	000	4		29.88		10	90	OVC					
KASD	1953	64	61	90	360	10	G 14	29.89	1012.3	10	90	OVC	TR-				
KASD	2006	63	61	93	060	10		2.983		8	95	OVC					
KASD	2051	64	63	94	020	14	G 19	29.86		4	50	OVC	TR+				
KASD	2053	64	62	93	360	15	G 21	29.88	1011.9	4	50	OVC	TR+				
KASD	2102	63	62	97	050	15	G 27	29.90		4	50	OVC	TR				
KASD	2104	63	62	97	290	21	G 38	29.91		2.5	17	OVC	TR+				
KASD	2112	65	62	90	040	18	G 39	29.85		1.2	25	OVC	TR+				
KASD	2120	64	62	93	000	0		29.87		1.8	29	OVC	TR+				
KASD	2127	64	62	93	150	11		29.91		1.8	30	OVC	TR+				
KASD	**2136**	**64**	**62**	**93**	**090**	**15**	**G 23**	**29.83**		**1.5**	**28**	**OVC**	**TR+**				
KASD	2141	64	62	93	100	12	G 23	29.85		2.0	32	OVC	TR+				
KASD	2144	64	62	93	100	11	G 21	29.85		3	32	OVC	TR				
KASD	2153	64	62	93	170	10	G 15	29.92	1013.2	9	95	OVC					
KASD	2201	64	62	93	130	8	G 18	29.89		5	55	OVC	TR				
KASD	2211	64	62	93	000	5		29.87		2.5	60	OVC	TR				
KASD	2216	64	63	96	000	5		29.88		5	90	OVC					
KASD	2239	64	62	93	360	10		29.95		7	60	OVC	TR+				
KASD	2253	64	63	96	020	14	G 21	29.96	1014.5	2.5	60	OVC	TR+				
KASD	2320	64	63	96	040	8		29.93		4	46	OVC	TR+				
KASD	2353	64	63	96	040	9		29.89	1012.1	4	60	OVC	TR				
KASD	0053	64	62	93	070	5		29.92	1013.0	6	85	OVC	TR		77	55	2.04

The Slidel observations indicated light winds and clear skies with visibility unrestricted on May 2, 2017 surrounding the period of the grounding. Early on May 3, around 1030 CDT strong gusty southerly winds were reported as a line of thunderstorms approached and a defined wind shift

occurred from the south to the west with thunderstorms and rain, overcast skies and visibilities restricted under 3 miles, which continued through the time of the accident. Winds were variable and shifted to the northeast with the highest wind gusts to 39 knots in thunderstorms and heavy rain at 2112 CDT immediately prior to the sinking. A total of 2.63 inches of rainfall was recorded ending on May 3rd.

Immediately prior to the *S/V Vanguard's* sinking Slidel reported the following conditions:

KASD special weather observation at 2012 CDT, automated, wind from 040° at 18 knots gusting to 39 knots, visibility 1 ¼ statute miles in thunderstorm in heavy rain and mist, a few clouds at 800 ft agl, ceiling broken at 2,500 ft, overcast at 5,000 ft, temperature 64° F, dew point 63° F, altimeter 29.85 inches of mercury. Remarks: automated observation system, peak wind from 340° at 39 knots occurred at 2105 CDT, wind shift at 2048 CDT, lightning distant all quadrants, hourly precipitation 0.36 inches.

2.2 New Orleans Lakefront Airport, Louisiana

The next closest weather reporting site was located about 18 and 16 miles southwest from the grounding and sinking respectively from New Orleans Lakefront Airport (KNEW), located on the southern shore of Lake Pontchartrain at an elevation of 7 ft. The airport also had an ASOS and reported the following conditions surrounding the period.

ID (STN)	TIME (CDT)	T (F)	TD (F)	RH (%)	DIR (°tr)	SPD (KT)	GST (KT)	ALT ("Hg)	SLP (hPa)	VIS (SM)	CIG	COV	WX	MAX (F)	MIN (F)	PR6 (IN)	PR24 (IN)
May 2, 2017																	
KNEW	0053	70	58	66	220	4		30.00	1015.1	10		CLR		80	67		
KNEW	0153	68	58	70	200	5		30.00	1015.2	10		CLR					
KNEW	0253	68	59	73	200	4		30.02	1015.7	10		CLR					
KNEW	0253	64	57	78	170	5		30.02	1015.9	10		CLR					
KNEW	0453	64	60	87	190	4		30.02	1016.0	10		CLR					
KNEW	0553	64	60	87	180	3		30.04	1016.5	10		CLR					
KNEW	0653	67	61	81	000	0		30.06	1017.4	10		CLR		72	63		
KNEW	**0753**	**72**	**61**	**68**	**100**	**4**		**30.09**	**1018.1**	**10**		**CLR**					
KNEW	0853	76	58	54	100	3		30.09	1018.4	10		CLR					
KNEW	0953	79	57	47	110	7		30.10	1018.5	10		CLR					
KNEW	1053	82	53	37	120	8		30.09	1018.3	10		CLR					
KNEW	1153	83	53	36	000	6		30.09	1018.2	10		CLR					
KNEW	1253	84	49	30	000	5		30.07	1017.5	10		CLR		84	68		
KNEW	1353	84	54	36	110	6		30.05	1017.0	10		CLR					
KNEW	1453	85	53	34	110	9		30.04	1016.6	10		CLR					
KNEW	1553	84	56	38	110	8		30.02	1016.0	10		CLR					
KNEW	1653	83	56	40	110	11		30.01	1015.4	10		CLR					
KNEW	1753	83	52	34	140	8		30.00	1015.1	10		CLR					
KNEW	1853	80	56	44	130	8		30.00	1015.2	10		CLR		86	80		
KNEW	1953	77	56	48	140	8		30.01	1015.7	10		CLR					
KNEW	2053	75	59	57	130	8		30.03	1016.1	10		CLR					
KNEW	2153	73	62	68	140	7		30.04	1016.5	10		CLR					
KNEW	2253	71	61	70	160	7		30.04	1016.5	10		CLR					
KNEW	2353	71	61	70	150	7		30.03	1016.1	10		CLR					
May 3, 2017																	
KNEW	0053	69	62	78	150	7		30.01	1015.7	10		CLR		86	63		
KNEW	0153	69	62	78	160	6		30.00	1015.3	10		CLR					

KNEW	0253	68	62	81	150	6		29.98	1014.6	10		CLR							
KNEW	0353	67	62	84	160	6		29.97	1014.1	10		CLR							
KNEW	0453	66	62	87	170	7		29.97	1014.3	10		CLR							
KNEW	0553	67	62	84	150	6		29.97	1014.3	10		CLR							
KNEW	0653	69	65	87	130	5		29.99	1014.7	10		CLR					69	66	
KNEW	0753	73	65	76	130	8		29.97	1014.2	10		CLR							
KNEW	0827	75	65	71	140	11		29.97			2	FEW							
KNEW	0853	78	63	60				29.96	1013.8	10	100	SCT							
KNEW	0953	76	60	58	140	14		29.94	1013.1	10	80	BKN							
KNEW	1040	76	61	60	160	14		29.96		10	80	BKN	T						
KNEW	1053	75	62	64	190	12		30.00	1015.3	10	80	OVC	TR-						
KNEW	1107	72	64	76	200	14	G 21	30.02		1.8	80	OVC	TR+						
KNEW	1123	71	67	87	100	10		30.00		3	70	OVC	TR-						
KNEW	1141	72	67	84	100	13		29.96		9	110	BKN							
KNEW	1153	71	65	81	120	13	G 19	29.94	1013.2	7	110	BKN	R-						
KNEW	1231	69	62	78	210	8		29.99		10	110	OVC							
KNEW	1253	68	62	81	150	15		29.98	1014.4	5	90	OVC	TR-	7			78	68	
KNEW	1309	68	62	81	110	18	G 26	29.89		3	70	OVC	TR						
KNEW	1350	66	63	88	3	10	11	29.96		2.0	55	OVC	TR						
KNEW	1353	67	63	87	310	15		29.98	1014.5	3	55	OVC	TR-						
KNEW	1401	66	63	90	310	27	G 31	29.99		1.8	55	OVC	TR+						
KNEW	1406	65	63	93	300	28	G 39	30.03		0.5	28	OVC	TR+						
KNEW	1418	64	63	94	030	17	G 28	30.00		1.0	28	OVC	TR+						
KNEW	1426	64	62	93	050	16		30.01		2.0	30	OVC	TR+						
KNEW	1431	64	62	93	040	17		30.00		3	30	OVC	TR+						
KNEW	1450	65	63	93	320	20	G 28	30.09	1018.2	2.0	75	OVC	TR+						
KNEW	1457	64	62	93	030	6		30.09		1.0	41	OVC	TR+						
KNEW	1450	64	63	94	320	20	G 28	30.09		2.0	75	OVC	TR+						
KNEW	1510	65	63	93	070	20		29.97		2.0	42	OVC	TR+						
KNEW	1516	64	63	96	070	22		29.97		3	42	OVC	TR						
KNEW	1532	64	62	93	060	21		29.98		10	110	BKN							
KNEW	1545	64	61	90	080	15		29.98		10	110	BKN	R-						
KNEW	1553	63	61	93	070	13		29.97	1014.1	10	110	SCT							
KNEW	1607	65	61	87	050	15		29.98		10	120	SCT							
KNEW	1622	66	60	81	060	16		29.95		10	120	FEW							
KNEW	1653	65	61	87	090	19		29.87	1010.7	10	120	SCT							
KNEW	1753	69	58	68	110	21	G 28	29.86	1010.6	10	100	SCT							
KNEW	1853	68	60	76	130	20	G 26	29.84	1009.9	10	85	OVC					69	63	1.08
KNEW	1930	68	60	76	130	19	G 28	29.84		10	75	OVC							
KNEW	1945	67	61	81	130	16	G 22	29.86		5	65	OVC	TR+						
KNEW	1953	66	62	87	130	17	G 22	29.84	1009.9	3	65	OVC	TR+						
KNEW	2010	66	62	87	140	19	G 27	29.81		7	44	OVC							
KNEW	2053	67	64	90	120	15	G 24	29.79	1008.0	9	70	BKN							
KNEW	**2109**	**68**	**64**	**87**	**350**	**29**	**G36**	**29.88**		**10**	**44**	**OVC**	**TR-**				**WIND SHIFT**		
KNEW	2118	67	64	90	310	13	G 33	29.90		2.0	24	OVC	TR-						
KNEW	2120	67	64	90	040	19	G 33	29.86		1.2	24	OVC	TR+						
KNEW	2128	68	65	90	040	8	G 29	29.95		0.8	20	OVC	TR+						
KNEW	**2134**	**66**	**65**	**96**	**060**	**15**		**29.90**		**2.0**	**27**	**OVC**	**TR**						
KNEW	2141	66	64	93	080	12		29.90		4	31	OVC	TR						
KNEW	2153	66	64	93	080	13		29.89	1011.5	10	41	OVC							
KNEW	2227	66	64	93	080	15	G 20	29.86		7	55	OVC	TR-						
KNEW	2250	66	64	94	050	15		29.90		9	50	OVC							
KNEW	2253	67	65	93	050	16		29.90	1011.8	10	50	OVC							
KNEW	2304	67	65	93	040	22		29.90		5	29	OVC							
KNEW	2320	67	65	93	030	34	G 43	29.88		2.5	12	OVC							
KNEW	2324	67	65	93	040	36	G 43	29.87		1.8	20	OVC							

KNEW	2336	67	65	93	020	28	G 39	29.94		2.5	41	OVC			
KNEW	2341	67	65	93	020	27	G 33	29.95		1.8	29	OVC	TR+		
KNEW	2353	67	65	93	040	26	G 31	29.89	1011.4	1.0	30	OVC	TR+		
KNEW	0053	66	64	93	070	19	G 25	29.89	1011.6	4	70	OVC		78	63	1.43

The summary indicated that calm winds and clear skies prevailed at the time of the grounding, with a significant change occurring on the morning of May 3rd when about 1100 CDT gusty southerly winds over 20 knots began as an approaching weather front with thunderstorms moved into the area with heavy rain and strong wind gusts. At 2109 CDT, a significant boundary moved across the station with a wind shift from the south to the north, with corresponding strong wind gusts to 36 knots. The maximum wind gusts to 43 knots were reported after the sinking around 2320 CDT. A total of 2.51 inches of rainfall was reported at the station on May 3rd.

The following conditions were reported about the time of the sinking of the *S/V Vanguard*:

KNEW special weather observation at 2134 CDT, automated, wind from 040° at 8 knots gusting to 29 knots, visibility ¾ statute miles in thunderstorm and heavy rain and mist, scattered clouds at 1,100 ft agl, ceiling broken at 2,000 ft, overcast at 4,300 ft, temperature 68° F, dew point 64° F, altimeter 29.95 inches of mercury. Remarks; automated observation system, peak wind from 350° at 36 knots occurred at 2108 CDT, wind shift at 2108 CDT, lightning distant all quadrants, thunderstorm began at 2103, hourly precipitation 0.53 inches.

3.0 Buoy Data - Tides

The New Canal Station, LA (NWCL1) buoy number 8761927 located on the southern shore of Lake Pontchartrain or about 20 miles southwest of the sinking location. Figure 7 is a plot of the winds for the period from May 2, 2017 through May 4, 2017, with the wind direction provided by the black arrows, the sustained wind in blue and the peak gust in red. The station reported a significant wind shift from the south to the north occurred near 2100 CDT or immediately after the sinking. At the time of the sinking the wind was reported from the southeast at 6 knots with gusts to 15 knots, with a reported peak gusts of 37 knots from the north-northeast immediately after the accident.

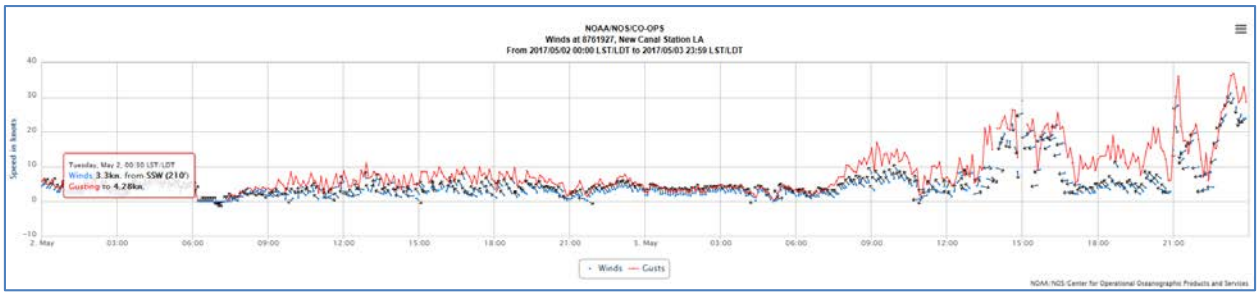

Figure 7 - New Channel Buoy Observed Winds

Figure 8 is the New Channel Buoy water levels for the same period and indicated the water level as 0.889 ft above the mean water level at the time of the sinking, with a peak of 3.238 ft observed after the sinking at 2342 CDT and corresponded to the period of peak wind gusts.

Figure 8 - New Channel Buoy Observed Water Levels

The water temperature reported at the time of the sinking was 21.7° Celsius (C) or 71° F.

4.0 Satellite Imagery

The GOES-13 infrared image at 2125 CDT or at the time of the sinking of the S/V Vanguard at 4X magnification with a standard MB temperature enhancement curve applied is included as figure 9. The image depicts a large area of cumulonimbus clouds over southeast Louisiana associated with a Mesoscale Convective System (MCS)[2]. The radiative cloud top temperature over the sinking location was 202° Kelvin or -71.16° C, which corresponded to cloud tops near 43,500 ft based on the NWS Slidel upper air sounding.

[2] A Mesoscale Convective System (MCS) is a complex of thunderstorms that becomes organized on a larger scale than the individual thunderstorms but smaller then extratropical frontal cyclones, and normally persists for several hours or more.

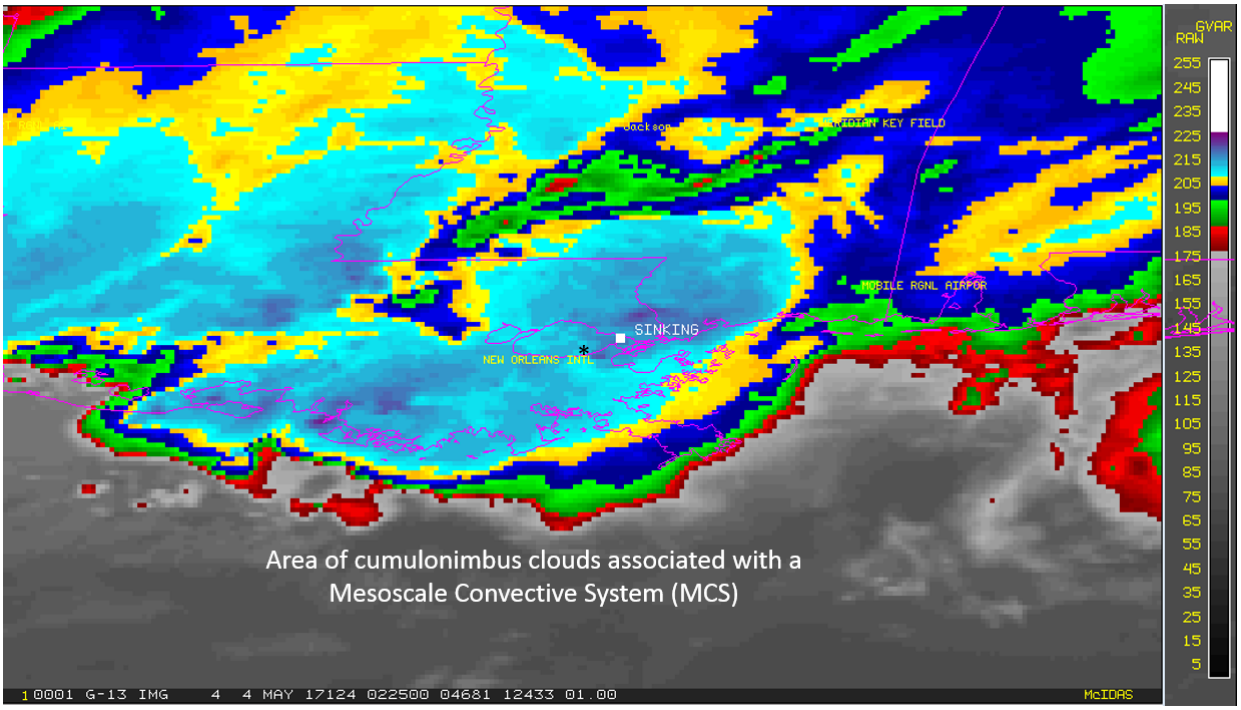

Figure 9 - GOES-13 infrared satellite image at 2125 CDT with temperature enhancement curve applied

5.0 Weather Surveillance Radar Imagery

The closest Weather Surveillance Radar-1988, Doppler (WSR-88D) to the accident site was from the NWS New Orleans (KLIX) location 8 miles north of the accident site. The level II and III archive data was obtained from NCEI utilizing the Hierarchical Data Storage System (HDSS) and displayed using the NWS NEXRAD Interactive Viewer and Data Exporter software.

The WSR-88D is a S-band 10 centimeter wavelength radar with a power output of 750,000 watts, with a 28-foot parabolic antenna concentrating the energy into a 0.95° beam width. The radar produces three basic types of products reflectivity, radial velocity, and spectral width..

Reflectivity is the measure of the efficiency of a target in intercepting and returning radio energy and is normally displayed in decibels (dBZ[3]), and is a general measure of echo intensity. The chart below relates the NWS video integrator and processor (VIP) intensity levels versus the WSR-88D's display levels, precipitation mode reflectivity in decibels, and rainfall rates.

[3] dBZ - 10 log Ze

NWS VIP/DBZ CONVERSION TABLE

NWS VIP	WSR-88D Level	PREC MODE dBZ	RAINFALL
0	0	< 5	
	1	5 to 9	
	2	10 to 14	
1	3	15 to 19	.01 in/hr
Very Light	4	20 to 24	.02 in/hr
	5	25 to 29	.04 in/hr
2	6	30 to 34	.09 in/hr
Light to	7	35 to 39	.21 in/hr
Moderate			
3	8	40 to 44	.48 in/hr
Strong			
4	9	45 to 49	1.10 in/hr
Very Strong			
5	10	50 to 54	2.49 in/hr
Intense			
6	11	55 to 59	>5.67 in/hr
Extreme	12	60 to 64	
	13	65 to 69	
	14	70 to 74	
	15	> 75	

Figure 10 and 11 are the KLIX WSR-88D 0.5° base reflectivity images at 2102 and 2109 CDT respectively, with the location of the grounding and the sinking of *S/V Vanguard* noted. A line of intense to extreme intensity echoes approaches and then moves over the sinking location between the periods with echoes of 52 to 58 dBZ or intense to extreme intensity echoes over the location of the sinking at 2109 CDT.

Figures 12 and 13 are the KLIX WSR-88D radial velocity winds at 2102 and 2109 CDT, with winds towards the radar in green and winds away from the radar in red. The actual winds at the surface will typically be higher than observed due to the radial component towards or away from the radar is only measured. A review of the radial velocity images for the same period from the WSR-88D indicated strong winds of 50 to 55 knots at 430 ft away from the radar site which preceded the leading edge of the line of precipitation echoes observed in the base reflectivity, and over the sinking location between 2102 and 2109 CDT.

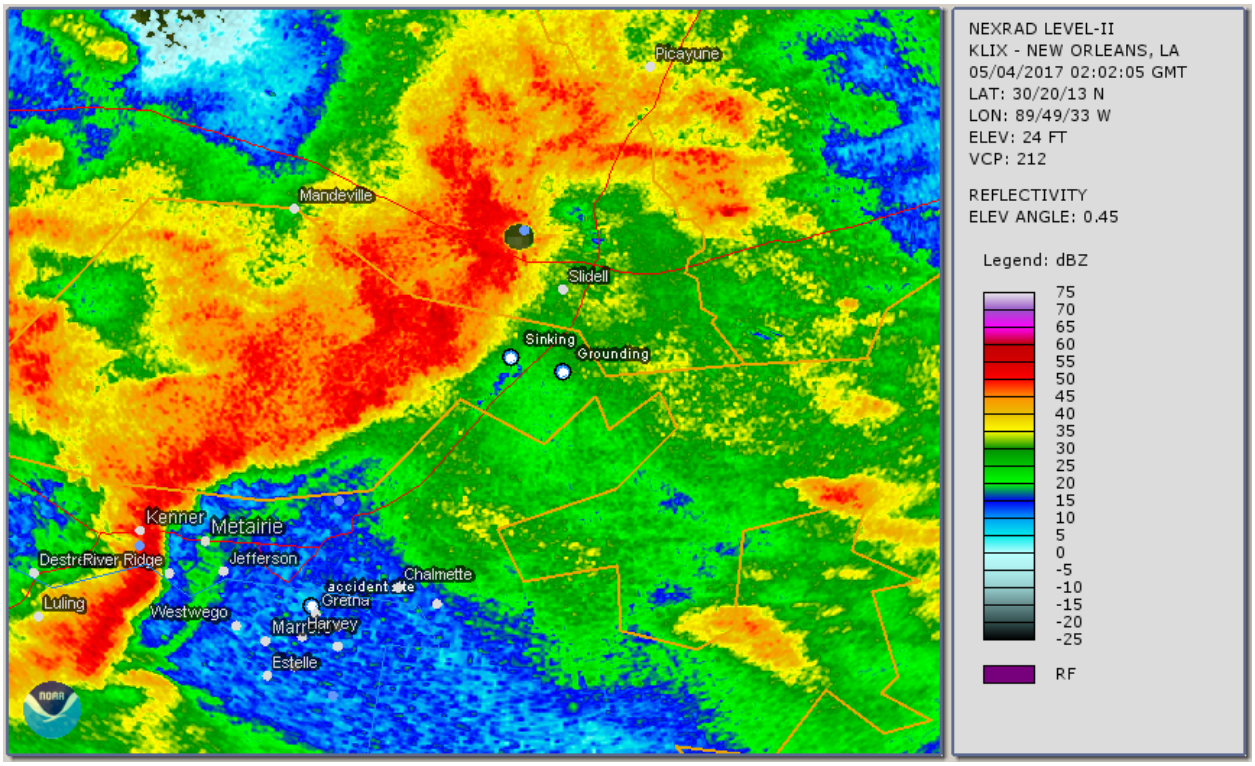

Figure 10 - NWS New Orleans WSR-88D base reflectivity image at 2102 CDT

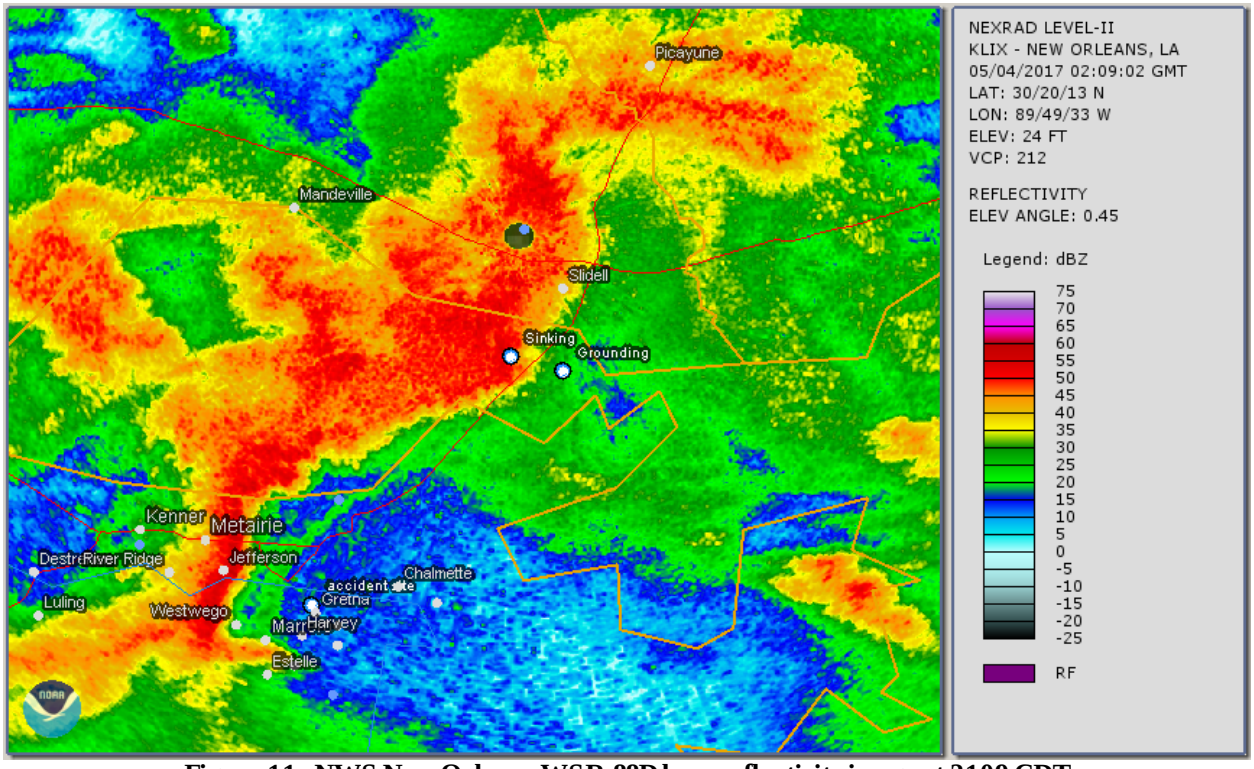

Figure 11 - NWS New Orleans WSR-88D base reflectivity image at 2109 CDT

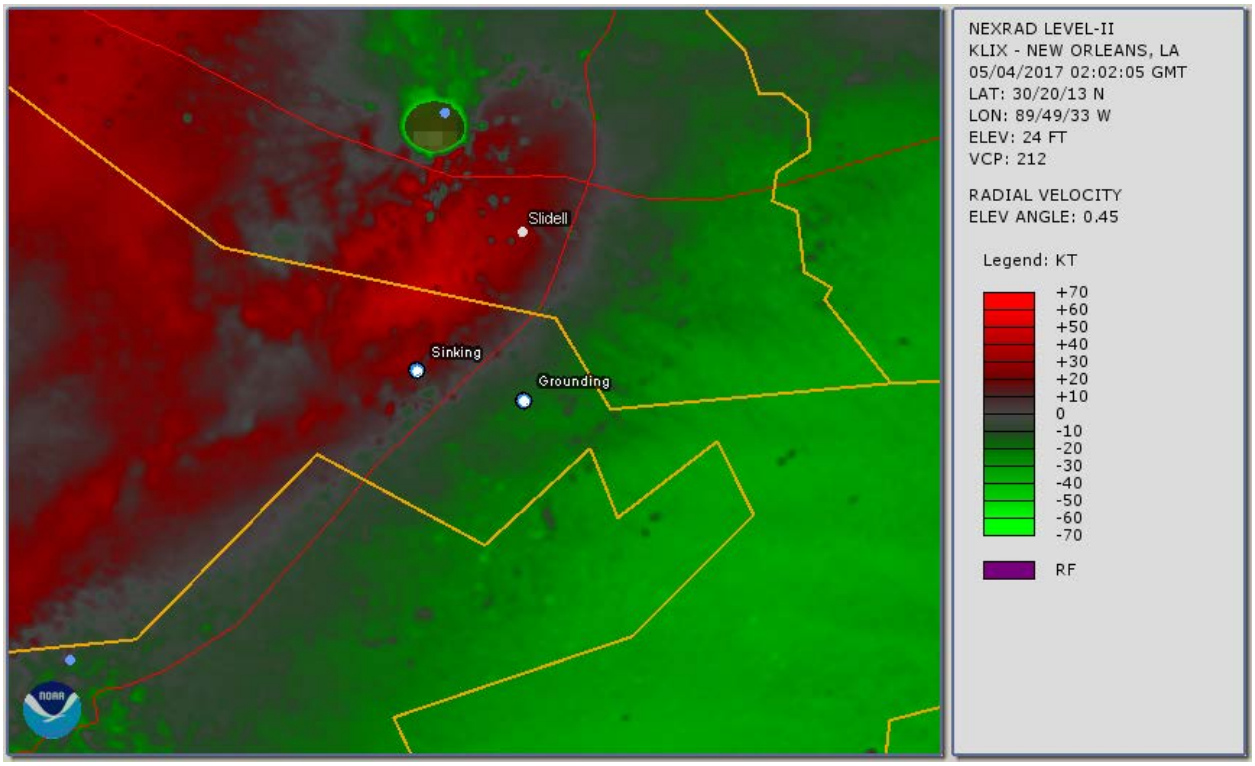

Figure 12 – NWS New Orleans WSR-88D radial velocity image at 2102 CDT

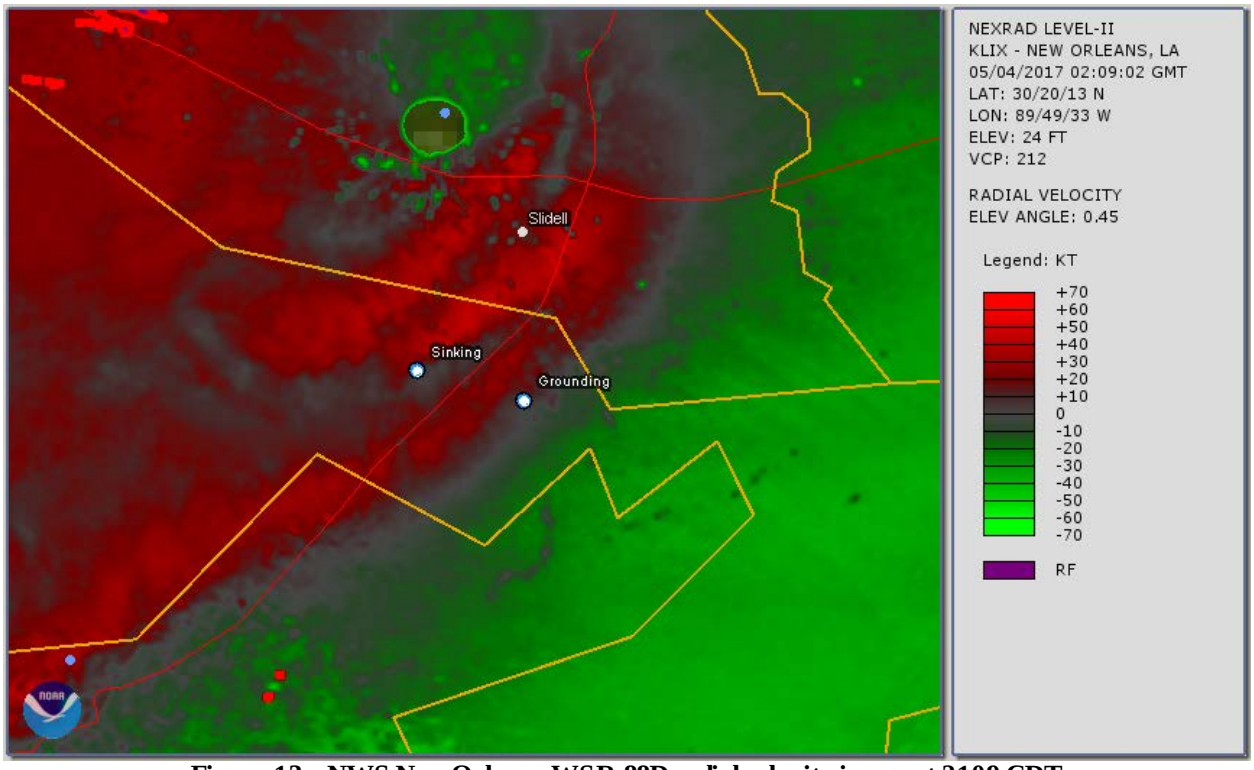

Figure 13 – NWS New Orleans WSR-88D radial velocity image at 2109 CDT

6.0 NWS Weather Watches

As indicated in the morning Convective Outlook (section 1.2), the NWS SPC expected an enhanced risk of severe thunderstorm development across the region. At 1700 CDT the NWS SPC issued a Severe Thunderstorm Watch number 192 for western Louisiana due to a band of strong to severe thunderstorms moving eastward at 25 knots with potential wind gusts to 60 knots, isolated hail to 2 inches, and a few possible tornadoes. The warning was current until 2400 CDT. Figure 14 is the initial radar and the counties impacted.

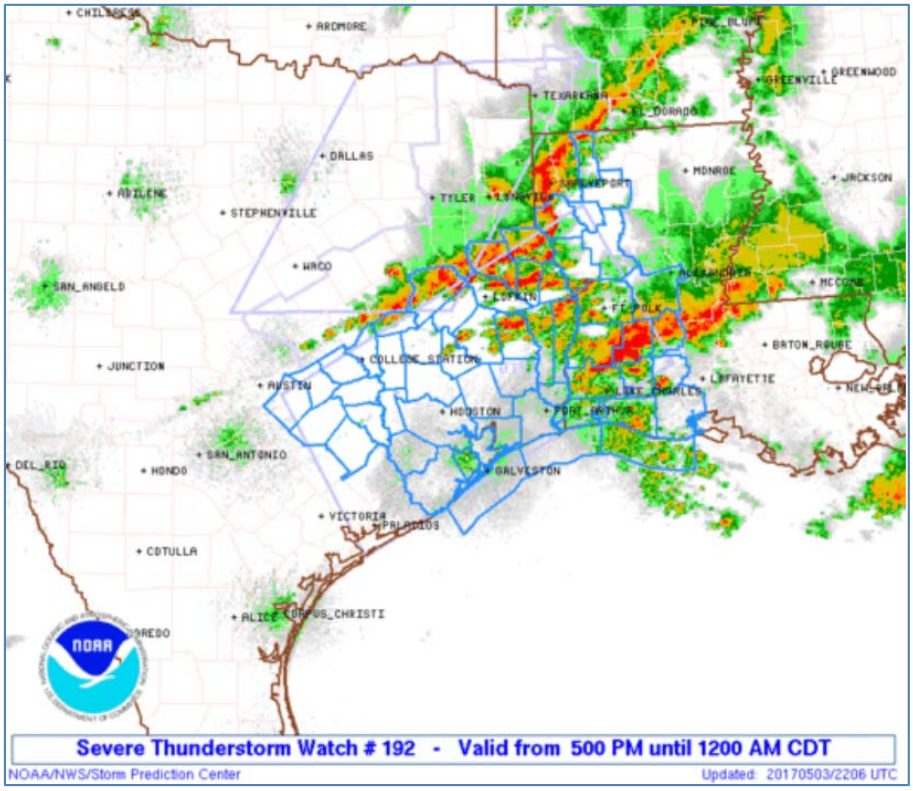

Figure 14 - Severe Weather Watch 192

The NWS SPC did not issue any other weather watches for the area during the period. A Mesoscale Discussion (MCD) number 643 was issued at 1854 CDT discussing the conditions over central Louisiana and indicated that while several thunderstorm areas were continuing over the state, the threat of severe weather was considered marginal and that additional weather watches were not anticipated for the evening over the region. Figure 15 is the graphic of the MCD followed by the discussion.

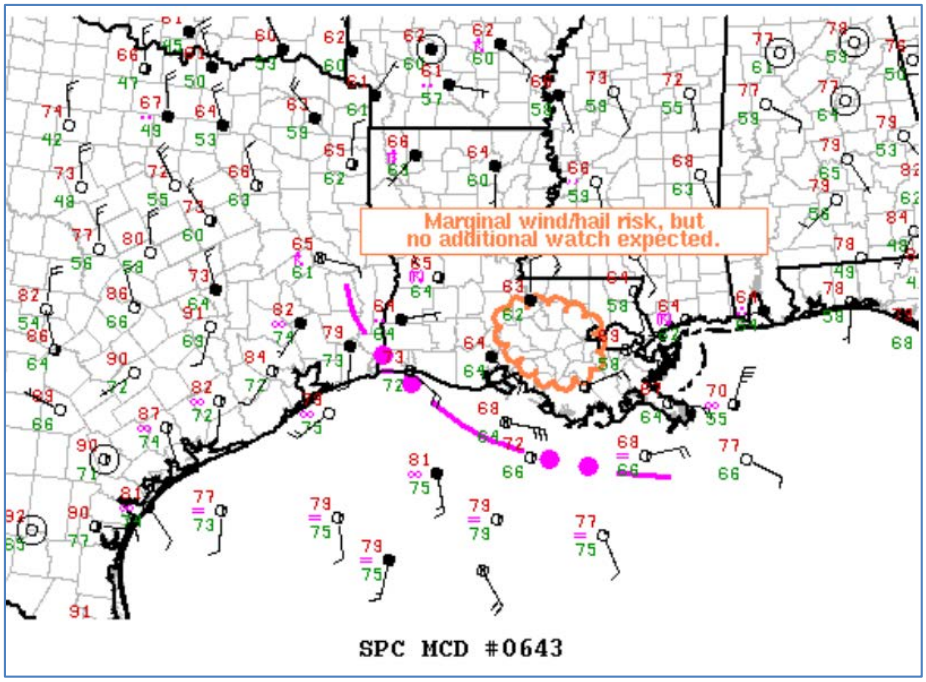

Figure 15 - NWS SPC Mesoscale Discussion number 643

Mesoscale Discussion 0643
NWS Storm Prediction Center Norman OK
0654 PM CDT Wed May 03 2017

Areas affected...South central Louisiana

Concerning...Severe potential...Watch unlikely

Valid 032354Z - 040130Z

Probability of Watch Issuance...20 percent

SUMMARY...Marginal wind/hail risk may persist for another couple of hours on cold side of outflow, but a watch is not anticipated.

DISCUSSION...Bands of elevated thunderstorms are ongoing over south central LA, in a zone of pronounced low-level warm advection atop the cold pool generated by numerous thunderstorms through the day. Surface observations show temperatures and dewpoints in the mid-low 60s, with the buoyancy feeding the storms rooted above the stable surface layer. Strong storm-relative inflow from the southeast in the low levels, along the northeast edge of the steeper midlevel lapse rates, should help maintain the forward-propagating storms, as well as a marginal risk for strong wind gusts and some hail. However, the threat for damaging winds will be largely mitigated by the stable near-surface layer within the cold pool. Thus, an additional watch is not currently anticipated across southern LA.

..Thompson/Edwards.. 05/03/2017

...Please see www.spc.noaa.gov for graphic product...

ATTN...WFO...LIX...LCH...

LAT...LON 30599182 30679122 30529064 30189043 29859049 29699076
29639112 29829151 30309197 30599182

7.0 NWS Coastal Weather Forecasts

The NWS Baton Rouge/New Orleans forecast office issued the following coastal waters forecast for the region. The forecast product typically goes out to 5 days. However, for this study only the forecast through 24 hours are reproduced below. The coastal waters forecasts issued prior to the grounding and the sinking are included below.

7.1 Grounding

The NWS coastal waters forecast issued about 0330 CDT in the early morning period prior to the grounding was as follows:

FZUS54 KLIX 020833
CWFLIX
COASTAL WATERS FORECAST
NATIONAL WEATHER SERVICE NEW ORLEANS LA
333 AM CDT TUE MAY 2 2017

SEAS ARE PROVIDED AS A RANGE OF THE AVERAGE HEIGHT OF THE HIGHEST 1/3 OF THE WAVES...ALONG WITH THE OCCASIONAL HEIGHT OF THE AVERAGE HIGHEST TEN PERCENT OF THE WAVES.

.SYNOPSIS...WEAK HIGH PRESSURE WILL WILL BEGIN TO MOVE EAST OF THE COASTAL WATERS THROUGH WEDNESDAY. A WARM FRONT AND A COLD FRONT IS EXPECTED TO IMPACT THE AREA WEDNESDAY MORNING INTO EARLY THURSDAY. HIGH PRESSURE WILL THEN SETTLE OVER THE NORTHERN GULF FRIDAY THROUGH THE WEEKEND.

GMZ530-022115-
LAKE PONTCHARTRAIN AND LAKE MAUREPAS-
333 AM CDT TUE MAY 2 2017

.TODAY...SOUTHEAST WINDS 5 TO 10 KNOTS. WAVES 1 FOOT OR LESS.
DOMINANT PERIOD 4 SECONDS.

.TONIGHT...SOUTHEAST WINDS NEAR 10 KNOTS. WAVES 2 FEET.
DOMINANT PERIOD 4 SECONDS.

.WEDNESDAY...SOUTHEAST WINDS 15 TO 20 KNOTS. WAVES 3 TO 4 FEET. DOMINANT PERIOD 4 SECONDS. CHANCE OF SHOWERS AND THUNDERSTORMS IN THE AFTERNOON.

.WEDNESDAY NIGHT...SOUTH WINDS 20 TO 25 KNOTS BECOMING WEST AFTER MIDNIGHT. WAVES 4 TO 6 FEET. DOMINANT PERIOD 4 SECONDS. SHOWERS AND THUNDERSTORMS LIKELY IN THE EVENING, THEN SHOWERS AND THUNDERSTORMS AFTER MIDNIGHT.

.THURSDAY...NORTHWEST WINDS 15 TO 20 KNOTS. WAVES 3 TO 4 FEET. DOMINANT PERIOD 4 SECONDS. CHANCE OF SHOWERS AND SLIGHT CHANCE OF THUNDERSTORMS IN THE MORNING.

.THURSDAY NIGHT...NORTHWEST WINDS 15 TO 20 KNOTS. WAVES 3 TO 4 FEET. DOMINANT PERIOD 4 SECONDS.

7.2 Sinking

The NWS coastal waters forecasts issued prior to the sinking were as follows beginning with the 0745 CDT morning forecast:

FZUS54 KLIX 031245
CWFLIX
COASTAL WATERS FORECAST
NATIONAL WEATHER SERVICE NEW ORLEANS LA
745 AM CDT WED MAY 3 2017

.SYNOPSIS...A WARM FRONT WILL MOVE NORTHEAST OUT OF THE GULF THIS MORNING. THIS WILL BE FOLLOWED BY A COLD FRONT MOVING THROUGH THE NORTH GULF WATERS THURSDAY MORNING. HIGH PRESSURE WILL THEN SETTLE OVER THE NORTHERN GULF THURSDAY INTO THE NEW WEEK.

GMZ530-040115-
LAKE PONTCHARTRAIN AND LAKE MAUREPAS-
745 AM CDT WED MAY 3 2017
...SMALL CRAFT EXERCISE CAUTION IN EFFECT FROM NOON CDT TODAY THROUGH THIS EVENING...
...SMALL CRAFT ADVISORY IN EFFECT FROM LATE TONIGHT THROUGH THURSDAY EVENING...

.TODAY...SOUTHEAST WINDS 10 KNOTS DURING THE MORNING RISING TO 15 TO 20 KNOTS BY NOON. WAVES 2 FEET BUILDING TO 3 TO 5 FEET. DOMINANT PERIOD 3 SECONDS. SLIGHT CHANCE OF SHOWERS AND THUNDERSTORMS EARLY IN THE AFTERNOON. SHOWERS AND THUNDERSTORMS LIKELY LATE.

.TONIGHT...SOUTH WINDS 25 KNOTS WITH GUSTS TO 35 KNOTS BECOMING SOUTHWEST AFTER MIDNIGHT. WAVES 4 TO 6 FEET. DOMINANT PERIOD 4 SECONDS. SHOWERS AND THUNDERSTORMS LIKELY EARLY IN THE EVENING, THEN SHOWERS AND THUNDERSTORMS IN THE LATE EVENING AND OVERNIGHT.

.THURSDAY...NORTHWEST WINDS 20 TO 25 KNOTS. WAVES 4 TO 6 FEET. DOMINANT PERIOD 4 SECONDS. CHANCE OF SHOWERS AND SLIGHT CHANCE OF THUNDERSTORMS IN THE MORNING.

The forecast was updated about 1000 CDT and was as follows:

FZUS54 KLIX 031508
CWFLIX
COASTAL WATERS FORECAST
NATIONAL WEATHER SERVICE NEW ORLEANS LA
1008 AM CDT WED MAY 3 2017

.SYNOPSIS...A WARM FRONT WILL MOVE NORTHEAST OUT OF THE GULF TODAY. THIS WILL BE FOLLOWED BY A COLD FRONT MOVING THROUGH THE NORTH GULF WATERS THURSDAY MORNING. HIGH PRESSURE WILL THEN SETTLE OVER THE NORTHERN GULF THURSDAY INTO THE NEW WEEK.

GMZ530-040330-
LAKE PONTCHARTRAIN AND LAKE MAUREPAS-
1008 AM CDT WED MAY 3 2017
...SMALL CRAFT EXERCISE CAUTION IN EFFECT THROUGH THIS EVENING...
...SMALL CRAFT ADVISORY IN EFFECT FROM LATE TONIGHT THROUGH THURSDAY EVENING...

.REST OF TODAY...SOUTHEAST WINDS 10 TO 15 KNOTS. WAVES 2 TO 4 FEET. DOMINANT PERIOD 4 SECONDS. CHANCE OF SHOWERS AND THUNDERSTORMS *EARLY IN THE MORNING, THEN SHOWERS AND THUNDERSTORMS LIKELY LATE IN THE AFTERNOON.*

.TONIGHT...SOUTH WINDS 20 TO 25 KNOTS BECOMING WEST AFTER MIDNIGHT. WAVES 3 TO 5 FEET WITH OCCASIONAL WAVES TO 6 FEET. DOMINANT PERIOD 4 SECONDS. SHOWERS AND THUNDERSTORMS LIKELY EARLY IN THE EVENING, THEN SHOWERS AND THUNDERSTORMS IN THE LATE EVENING AND OVERNIGHT.

.THURSDAY...NORTHWEST WINDS 20 TO 25 KNOTS. WAVES 3 TO 5 FEET. DOMINANT PERIOD 4 SECONDS. SLIGHT CHANCE OF THUNDERSTORMS EARLY IN THE MORNING. CHANCE OF SHOWERS IN THE MORNING.

The NWS Area Forecast Discussion (AFD) issued at 1542 CDT provided some insight to the marine forecast and indicated that the forecaster was expecting southerly winds, and shifting to the northwest on Thursday morning with the passage of the cold front. Wind speeds were also expected to increase to 15 to 20 knots, with to over 25 knots during the evening. Wind gusts were expected to be well above gale force as a squall line approaches the region. Some of the thunderstorms were expected to be severe as they move over all marine areas through Thursday morning. Strong northwest winds of 20 to 25 knots were expected as the cold front moves through the area and high pressure settles over the northern gulf coast. High pressure was expected to build over the area during the weekend and winds and seas lowering.

The afternoon update at 1630 CDT was as follows:

FZUS54 KLIX 032127
CWFLIX
COASTAL WATERS FORECAST
NATIONAL WEATHER SERVICE NEW ORLEANS LA
427 PM CDT WED MAY 3 2017

SEAS ARE PROVIDED AS A RANGE OF THE AVERAGE HEIGHT OF THE HIGHEST 1/3 OF THE WAVES...ALONG WITH THE OCCASIONAL HEIGHT OF THE AVERAGE HIGHEST TEN PERCENT OF THE WAVES.

GMZ530-041030-
LAKE PONTCHARTRAIN AND LAKE MAUREPAS-
427 PM CDT WED MAY 3 2017

...SMALL CRAFT EXERCISE CAUTION IN EFFECT UNTIL MIDNIGHT CDT TONIGHT...
...SMALL CRAFT ADVISORY IN EFFECT FROM MIDNIGHT CDT TONIGHT THROUGH THURSDAY EVENING...

.TONIGHT...SOUTH WINDS 15 TO 20 KNOTS BECOMING SOUTHWEST 20 TO 25 KNOTS AFTER MIDNIGHT. WAVES 3 TO 5 FEET. DOMINANT PERIOD 4 SECONDS. SHOWERS AND

THUNDERSTORMS LIKELY EARLY IN THE EVENING, THEN SHOWERS AND THUNDERSTORMS IN THE LATE EVENING.

.THURSDAY...NORTHWEST WINDS 20 TO 25 KNOTS. WAVES 3 TO 5 FEET. DOMINANT PERIOD 4 SECONDS. SLIGHT CHANCE OF THUNDERSTORMS EARLY IN THE MORNING. CHANCE OF SHOWERS IN THE MORNING.

8.0 NWS Hazardous Weather Outlooks

The NWS New Orleans forecast office issued the following hazardous weather outlooks for marine interests during the period:

FLUS44 KLIX 021704
HWOLIX

Hazardous Weather Outlook
National Weather Service New Orleans LA
1204 PM CDT Tue May 2 2017

GMZ530-532-534-536-538-550-552-555-557-570-572-575-577-LAZ034>037-039-040-046>050-056>072-MSZ068>071-077-080>082-030515-
Lake Pontchartrain and Lake Maurepas-Mississippi Sound-Lake Borgne-Chandeleur Sound-Breton Sound-Coastal Waters from Port Fourchon LA to Lower Atchafalaya River LA out 20 nm-

1204 PM CDT Tue May 2 2017

This Hazardous Weather Outlook is for portions of Southeast Louisiana...South Mississippi and the adjacent coastal waters.

.DAY ONE...This Afternoon and Tonight

No hazardous weather is anticipated at this time.

.DAYS TWO THROUGH SEVEN...Wednesday through Monday

Thunderstorms are expected Wednesday morning through and Wednesday night. Some of these are expected to become strong to severe. The main hazards expected with severe weather will be tornadoes, damaging winds and large hail. Heavy rainfall will also be possible.

.SPOTTER INFORMATION STATEMENT...
Spotter activation may be required Wednesday through Wednesday night.
24/RR

The forecast was updated at 1917 CDT on May 2, 2017 and was as follows:

FLUS44 KLIX 030017
HWOLIX

Hazardous Weather Outlook
National Weather Service New Orleans LA
717 PM CDT Tue May 2 2017

GMZ530-532-534-536-538-550-552-555-557-570-572-575-577-LAZ034>037-
039-040-046>050-056>072-MSZ068>071-077-080>082-031230-
Lake Pontchartrain and Lake Maurepas-Mississippi Sound-
717 PM CDT Tue May 2 2017

This Hazardous Weather Outlook is for portions of southeast Louisiana...southern Mississippi and the adjacent coastal waters.

.DAY ONE...Tonight

No hazardous weather is anticipated at this time.

.DAYS TWO THROUGH SEVEN...Wednesday through Monday

There is an enhanced risk of severe thunderstorms for extreme southwest Mississippi and parts of east central Louisiana north of Baton rouge Wednesday.

There is a slight risk of severe thunderstorms across southern Mississippi and southeast Louisiana Wednesday and Wednesday night.

A warm front associated the surface low will sweep northeast across central Louisiana and southwest Mississippi Wednesday morning into Wednesday afternoon. Thunderstorms are expected Wednesday morning into the afternoon. Some of these are expected to become strong to severe. The main hazards expected with severe weather will be isolated tornadoes, damaging winds and large hail mainly across parts of east central Louisiana and southwest Mississippi.

The associated cold front will push across the outlook area late Wednesday night into Thursday morning. Widespread showers and thunderstorms are expected ahead of the cold front. The main hazards expected with severe weather will be damaging winds and heavy rainfall over southeast Louisiana and southern Mississippi.

A Flash Flood Watch is in effect for southern Mississippi and east central Louisiana late Wednesday afternoon through Thursday morning. Rainfall amounts of 2 to 3 inches with locally higher amounts are possible.

The morning forecast issued at 0344 CDT on May 3, 2017 continued to warn of thunderstorms over the region during the day and evening. The advisory was as follows:

FLUS44 KLIX 030844
HWOLIX

Hazardous Weather Outlook
National Weather Service New Orleans LA
344 AM CDT Wed May 3 2017

GMZ530-532-534-536-538-550-552-555-557-570-572-575-577-LAZ034>037-
039-040-046>050-056>072-MSZ068>071-077-080>082-032045-
Lake Pontchartrain and Lake Maurepas-Mississippi Sound-Lake Borgne-Chandeleur Sound-Breton Sound-Coastal Waters from Port Fourchon LA to Lower Atchafalaya River LA out 20 nm-
344 AM CDT Wed May 3 2017

This Hazardous Weather Outlook is for portions of Southeast Louisiana...South Mississippi and the adjacent coastal waters.

.DAY ONE...Today and Tonight

There is an enhanced risk of severe thunderstorms for all areas through tonight. The main hazards with severe weather will be tornadoes, damaging winds and large hail.

A Flash Flood Watch is in effect for southern Mississippi and east central Louisiana from 1 pm today through 7 am Thursday. Total rainfall amounts are expected to be 2 to 4 inches with locally higher amounts possible.

Small craft advisories are posted starting at midnight tonight through at least Thursday afternoon.

.DAYS TWO THROUGH SEVEN...Thursday through Tuesday

Small craft advisories may be extended into Friday.

Morning update at 1028 CDT:

FLUS44 KLIX 031528
HWOLIX

Hazardous Weather Outlook
National Weather Service New Orleans LA
1028 AM CDT Wed May 3 2017

GMZ530-532-534-536-538-550-552-555-557-570-572-575-577-LAZ034>037-039-040-046>050-056>072-MSZ068>071-077-080>082-040330-
Lake Pontchartrain and Lake Maurepas-Mississippi Sound-Lake Borgne-Chandeleur Sound-Breton Sound-Coastal Waters from Port Fourchon LA to Lower Atchafalaya River LA out 20 nm-
1028 AM CDT Wed May 3 2017

This Hazardous Weather Outlook is for portions of Southeast Louisiana...South Mississippi and the adjacent coastal waters.

.DAY ONE...Today and Tonight

There is an enhanced risk of severe thunderstorms for all areas through tonight. The main hazards with severe weather will be tornadoes, damaging winds and large hail.

A Flash Flood Watch is in effect for all of southern Mississippi and southeast Louisiana through 7 am Thursday. Total rainfall amounts are expected to be 3 to 5 inches with locally higher amounts possible.

Small craft advisories are posted starting at midnight tonight through at least Thursday afternoon.

.DAYS TWO THROUGH SEVEN...Thursday through Tuesday

Small craft advisories may be extended into Friday.

Afternoon update at 1803 CDT, prior to United States Coast Guard towing operations:

FLUS44 KLIX 032303
HWOLIX

Hazardous Weather Outlook

National Weather Service New Orleans LA
603 PM CDT Wed May 3 2017

GMZ530-532-534-536-538-550-552-555-557-570-572-575-577-LAZ034>037-
039-040-046>050-056>072-MSZ068>071-077-080>082-041115-
Lake Pontchartrain and Lake Maurepas-Mississippi Sound-Lake Borgne-Chandeleur Sound-Breton Sound-Coastal Waters from Port Fourchon LA to Lower Atchafalaya River LA out 20 nm-
603 PM CDT Wed May 3 2017

This Hazardous Weather Outlook is for portions of Southeast Louisiana...South Mississippi and the adjacent coastal waters.

.DAY ONE...Tonight

There is a slight risk of severe thunderstorms for all of southern Mississippi and southeast Louisiana tonight. The main hazards with severe weather will be tornadoes, damaging winds and large hail.

A Flash Flood Watch is in effect for all of southern Mississippi and southeast Louisiana through 7 am Thursday. Total rainfall amounts are expected to be 3 to 5 inches with locally higher amounts possible.

Small craft advisories are posted starting at midnight tonight through at least Thursday afternoon.

.DAYS TWO THROUGH SEVEN...Thursday through Tuesday

Small craft advisories may be extended into Friday

9.0 NWS Special Marine Advisories

The NWS New Orleans WFO issued a Special Marine Advisory at 1323 CDT for severe thunderstorms expected to impact Lake Pontchartrain until 1345 CDT. The advisory was as follows:

WHUS54 KLIX 031823
SMWLIX
GMZ530-031845-
/O.NEW.KLIX.MA.W.0140.170503T1823Z-170503T1845Z/

BULLETIN - IMMEDIATE BROADCAST REQUESTED
SPECIAL MARINE WARNING
NATIONAL WEATHER SERVICE NEW ORLEANS LA
123 PM CDT WED MAY 3 2017

THE NATIONAL WEATHER SERVICE IN NEW ORLEANS HAS ISSUED A

** SPECIAL MARINE WARNING FOR...*
LAKE PONTCHARTRAIN AND LAKE MAUREPAS...

** UNTIL 145 PM CDT*

** AT 121 PM CDT...A STRONG CLUSTER OF THUNDERSTORMS WERE LOCATED 7 NM SOUTHWEST OF THE MID POINT OF THE CAUSEWAY BRIDGE...MOVING EAST AT 25 KNOTS.*

HAZARD...WIND GUSTS 34 KNOTS OR GREATER.

SOURCE...RADAR INDICATED.

IMPACT...EXPECT WIND GUSTS IN EXCESS OF 34 KNOTS AND SUDDENLY HIGHER WAVES. BOATS COULD SUSTAIN DAMAGE OR CAPSIZE. MAKE SURE ALL ON BOARD ARE WEARING LIFE JACKETS. RETURN TO SAFE HARBOR IF POSSIBLE.

** LOCATIONS IMPACTED INCLUDE...*
LAKE PONTCHARTRAIN/LAKE MAUREPAS...ORLEANS MARINA...LAKE MAUREPAS...THE MID POINT OF THE CAUSEWAY BRIDGE...MANDEVILLE...EDEN ISLE AND KENNER.

LAT...LON 3035 9006 3026 8998 3026 8989 3021 8979
3015 8974 3010 8982 3015 8986 3004 9000
3002 9018 3007 9039 3014 9043 3021 9041
3022 9044 3017 9056 3026 9058 3034 9048
3029 9040 3023 9043 3022 9040 3039 9019
TIME...MOT...LOC 1821Z 254DEG 39KT 3015 9024

HAIL...0.00IN
WIND...>34KTS
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Immediately following the Marine advisory, a Special Weather Statement was issued at 1341 CDT for the area for severe thunderstorms impacting the area.

WWUS84 KLIX 031841
SPSLIX

Special Weather Statement
National Weather Service New Orleans LA
141 PM CDT WED MAY 3 2017

LAZ060>062-031915-
Orleans LA-St. Charles LA-Upper Jefferson LA-
141 PM CDT WED MAY 3 2017

...SPECIAL WEATHER STATEMENT...

At 141 PM CDT, Doppler radar was tracking a strong thunderstorm over Boutte, or near Hahnville, moving northeast at 40 mph.

Half inch hail and winds in excess of 30 mph will be possible with 03this storm.

Locations impacted include...
New Orleans, Metairie, Hahnville, Avondale, Jefferson, Harahan, Westwego, Luling, River Ridge, Boutte, Ama, Destrehan, St. Rose, Norco, Paradis, Elmwood, Des Allemands, Bridge City, Taft and Waggaman.

LAT...LON 2995 9052 3006 9032 3005 9026 3003 9020 3002 9015 3002 9012 3003 9011 3003 9008
3004 9006 3003 9004 3005 9003 3004 9002 3005 8998 3000 8996 2982 9044
TIME...MOT...LOC 1841Z 246DEG 35KT 2990 9040

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A severe thunderstorm warning was issued for the region at 1424 CDT until 1500.

WUUS54 KLIX 031924
SVRLIX
LAC051-057-071-075-087-089-032000-
/O.NEW.KLIX.SV.W.0084.170503T1924Z-170503T2000Z/

BULLETIN - IMMEDIATE BROADCAST REQUESTED
Severe Thunderstorm Warning
National Weather Service New Orleans LA
224 PM CDT WED MAY 3 2017

The National Weather Service in New Orleans has issued a

** Severe Thunderstorm Warning for...*
Northwestern St. Bernard Parish in southeastern Louisiana...
Eastern St. Charles Parish in southeastern Louisiana...
Southwestern Orleans Parish in southeastern Louisiana...
East central Lafourche Parish in southeastern Louisiana...
Jefferson Parish in southeastern Louisiana...
Northwestern Plaquemines Parish in southeastern Louisiana...

** Until 300 PM CDT*

** At 223 PM CDT, severe thunderstorms were located along a line extending from Luling to 7 miles west of Barataria to near Cut Off, moving east at 45 mph.*

HAZARD...60 mph wind gusts and quarter size hail.

SOURCE...Radar indicated.

IMPACT...Hail damage to vehicles is expected. Expect wind damage to roofs, siding, and trees.

** Locations impacted include...*
New Orleans, Chalmette, Cut Off, Avondale, Metairie, Marrero, Harvey, Timberlane, Belle Chasse, Hahnville, Galliano, Larose, Port Sulphur, Jefferson, Gretna, Harahan, Westwego, Jean Lafitte, Luling and Poydras.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

For your protection move to an interior room on the lowest floor of a building.

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A tornado watch remains in effect until 500 PM CDT for southeastern Louisiana.

LAT...LON 2935 8992 2937 8990 2940 8991 2938 8996 2935 8995 2946 9038 2970 9034 2999 9042
3001 8985 2966 8972 2931 8977
TIME...MOT...LOC 1923Z 274DEG 41KT 2990 9035 2970 9025 2948 9032

HAIL...1.00IN
WIND...60MPH

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Another Special Marine Advisory was issued at 1445 CDT and valid until 1530 CDT for Lake Pontchartrain for severe thunderstorms. The advisory was as follows:

WHUS54 KLIX 031945
SMWLIX
GMZ530-534-032030-
/O.NEW.KLIX.MA.W.0142.170503T1945Z-170503T2030Z/

BULLETIN - IMMEDIATE BROADCAST REQUESTED
SPECIAL MARINE WARNING
NATIONAL WEATHER SERVICE NEW ORLEANS LA
245 PM CDT WED MAY 3 2017

THE NATIONAL WEATHER SERVICE IN NEW ORLEANS HAS ISSUED A

** SPECIAL MARINE WARNING FOR...*
LAKE BORGNE...
***LAKE PONTCHARTRAIN** AND LAKE MAUREPAS...*

** UNTIL 330 PM CDT*

**** AT 244 PM CDT...A STRONG CLUSTER OF THUNDERSTORMS WERE LOCATED NEAR LAKE PONTCHARTRAIN/LAKE MAUREPAS...MOVING EAST AT 25 KNOTS.***

HAZARD...WIND GUSTS 34 KNOTS OR GREATER.

SOURCE...RADAR INDICATED.

IMPACT...EXPECT WIND GUSTS IN EXCESS OF 34 KNOTS AND SUDDENLY HIGHER WAVES. BOATS COULD SUSTAIN DAMAGE OR CAPSIZE. MAKE SURE ALL ON BOARD ARE WEARING LIFE JACKETS. RETURN TO SAFE HARBOR IF POSSIBLE.

** LOCATIONS IMPACTED INCLUDE...*
THE MID POINT OF THE CAUSEWAY BRIDGE...LAKE PONTCHARTRAIN/LAKE MAUREPAS...RIGOLETS AND EDEN ISLE.

LAT...LON 3026 8998 3025 8987 3017 8972 3018 8958
3015 8959 3018 8954 3005 8950 3004 8975
3007 8969 3014 8963 3015 8963 3017 8975
3010 8982 3015 8986 3004 9000 3003 9021
3005 9026 3030 9030 3033 9004
TIME...MOT...LOC 1944Z 266DEG 46KT 3014 9005

HAIL...0.00IN
WIND...>34KTS
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Immediately after the sinking at 2107 CDT, the NWS issued another Special Marine Advisory for Lake Pontchartrain, the advisory was as follows:

WHUS54 KLIX 040207
SMWLIX

GMZ530-534-040300-
/O.NEW.KLIX.MA.W.0152.170504T0207Z-170504T0300Z/

BULLETIN - IMMEDIATE BROADCAST REQUESTED
SPECIAL MARINE WARNING
NATIONAL WEATHER SERVICE NEW ORLEANS LA
907 PM CDT WED MAY 3 2017

THE NATIONAL WEATHER SERVICE IN NEW ORLEANS HAS ISSUED A

** SPECIAL MARINE WARNING FOR...*
LAKE BORGNE...
LAKE PONTCHARTRAIN AND LAKE MAUREPAS...

** UNTIL 1000 PM CDT*

** AT 907 PM CDT...A STRONG THUNDERSTORM WAS LOCATED NEAR EDEN ISLE...*
MOVING EAST AT 35 KNOTS.

HAZARD...WIND GUSTS TO NEARLY 50 KNOTS.

SOURCE...RADAR INDICATED.

IMPACT...EXPECT WIND GUSTS IN EXCESS OF 34 KNOTS AND SUDDENLY HIGHER WAVES. BOATS COULD SUSTAIN DAMAGE OR CAPSIZE. MAKE SURE ALL ON BOARD ARE WEARING LIFE JACKETS. RETURN TO SAFE HARBOR IF POSSIBLE.

** LOCATIONS IMPACTED INCLUDE...*
LAKE BORGNE...ORLEANS MARINA...RIGOLETS AND EDEN ISLE.

LAT...LON 3025 8987 3018 8973 3018 8954 3014 8952
3002 8952 3000 8958 2997 8957 2999 8985
3004 8982 3003 8972 3006 8973 3015 8963
3017 8967 3017 8975 3010 8982 3015 8986
3004 9000 3002 9018 3026 8994
TIME...MOT...LOC 0207Z 262DEG 35KT 3018 8984

HAIL...0.00IN
WIND...49KTS
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10.0 Astronomical Conditions

The United States Naval Observatory's website provided the following astronomical conditions for the period for New Orleans, Orleans Parish, Louisiana.

May 2, 2017	
Moonset	0111 CDT
Beginning civil twilight	0551 CDT
Sunrise	0616 CDT
Moonrise	1216 CDT
Sun transit	1257 CDT

Sunset	1939 CDT
End civil twilight	2004 CDT

Phase of the moon was a first quarter with

May 3, 2017	
Moonset	0159 CDT
Beginning civil twilight	0550 CDT
Sunrise	0616 CDT
Sun transit	1257 CDT
Moonrise	1316 CDT
Sunset	1939 CDT
Moon transit	2001 CDT
End civil twilight	2005 CDT
Moonset	0242 CDT on following day

At the time of the sinking, or about 2000 CDT on May 3, the sun had set and was about -5° below the horizon at an azimuth of 292°. The moon was 72° above the horizon and at an azimuth of 179° and was 60% illuminated. The phase of the moon was a waxing gibbous.

Submitted by:

Don Eick
Senior Meteorologist